*5th NIST Workshop on Community Disaster Resilience*

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# NIST Community Resilience Program

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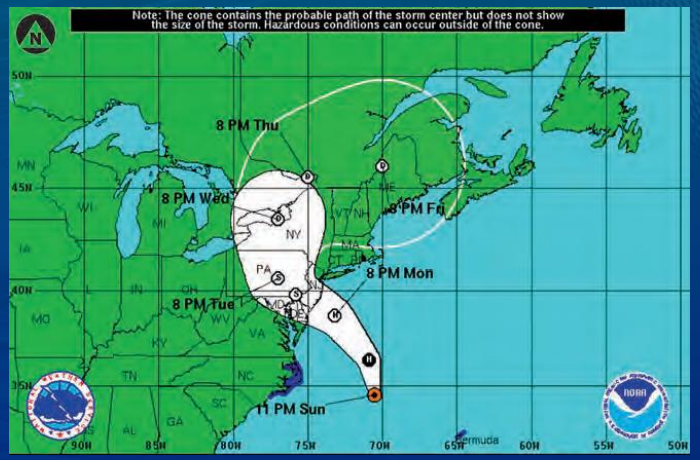
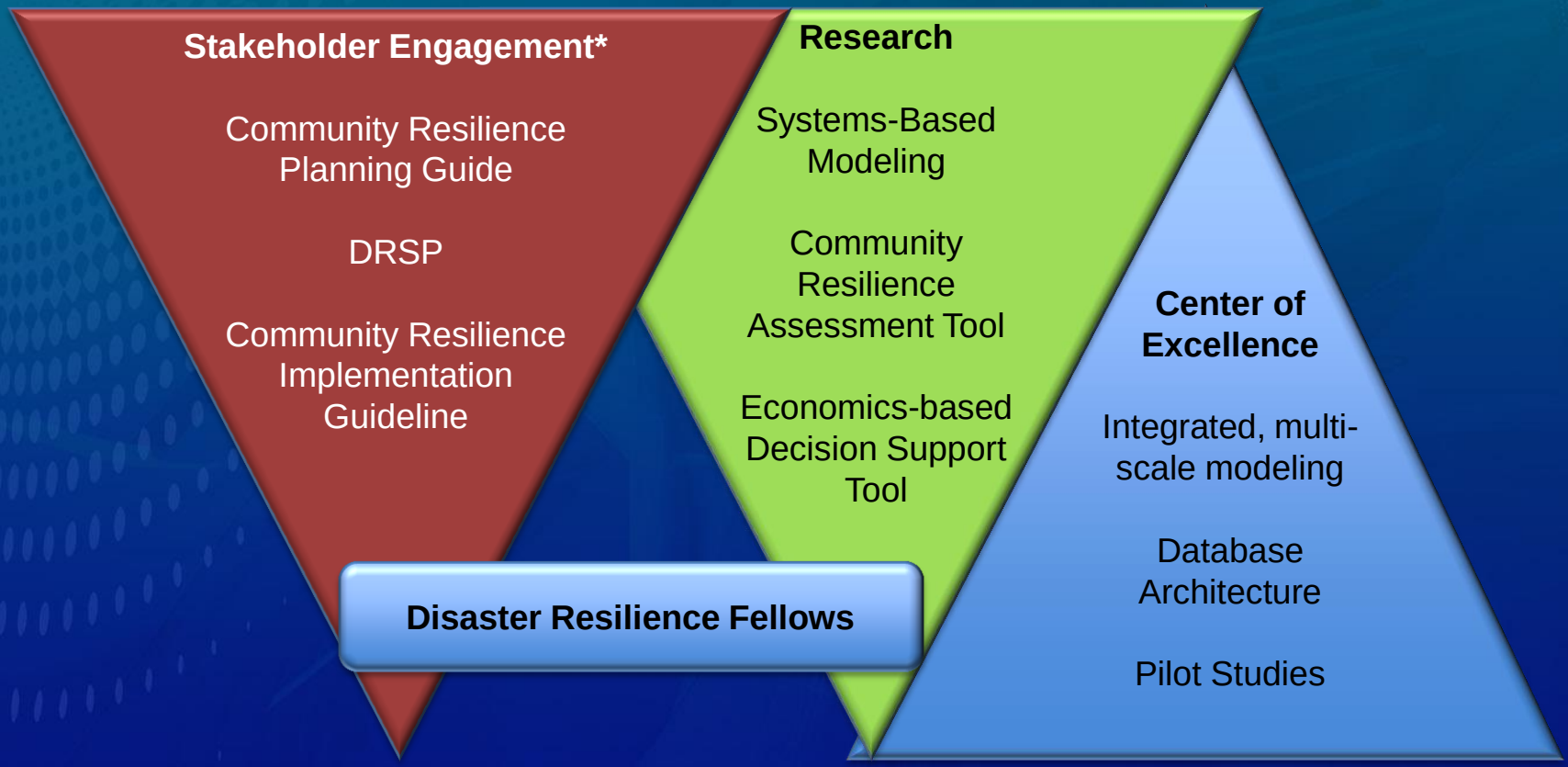
# What is the Problem?

- Natural and man-made disasters result in significant costs due to direct and indirect losses.
- Superstorm Sandy caused over $65B in losses.
- Large single events can cause losses exceeding $100B.
- Current approach of response and rebuilding is impractical and inefficient for dealing with natural disasters.
- Planning does not account for interconnected nature of buildings and infrastructure, nor for the affect on social institutions.
- Changing nature of hazards is not always considered.




# NIST Community Resilience Program




*Stakeholder Engagement component is called out in the President's Climate Action Plan

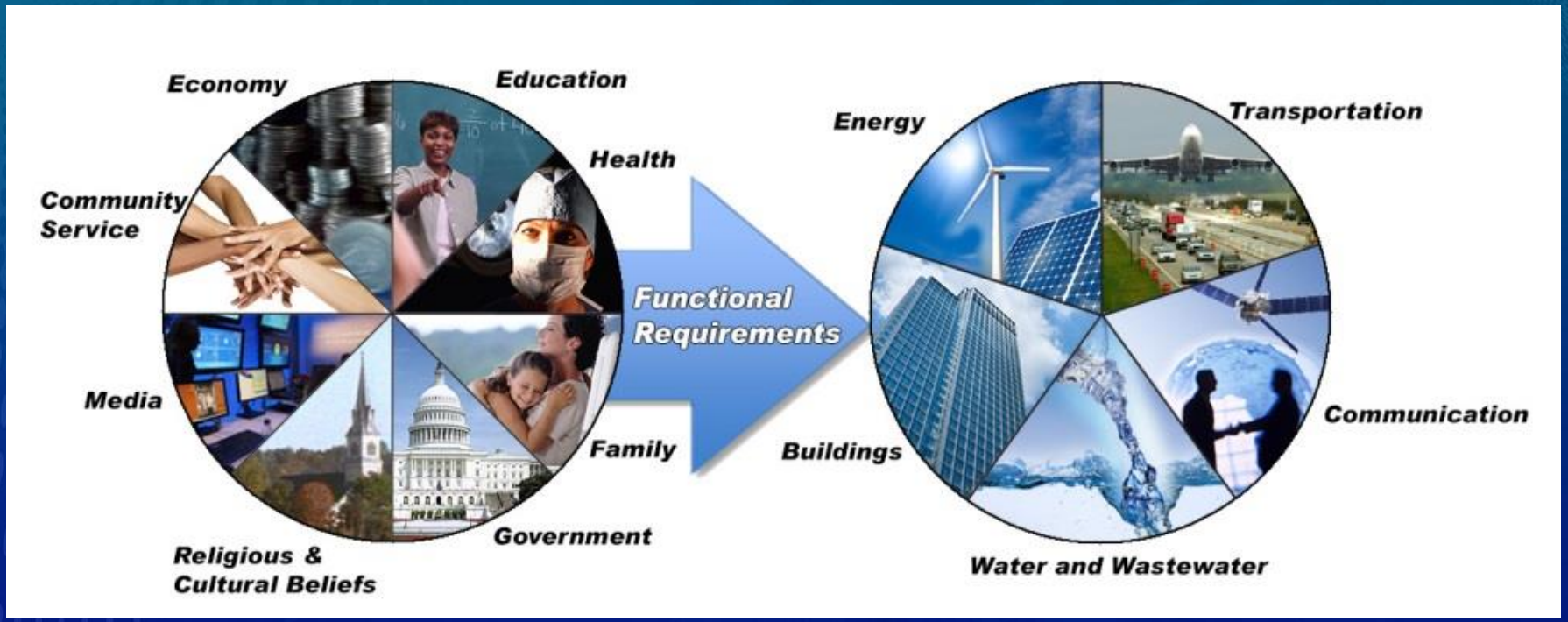
# What is Resilience?

- Resilience is defined as:
  - "the ability to *adapt* to changing conditions and *withstand* and *rapidly recover* from disruption due to emergencies". (PPD-8)
  - "the ability to *prepare for* and *adapt to* changing conditions and to *withstand* and *recover rapidly* from disruptions. Resilience includes the ability to withstand and recover from deliberate attacks, accidents, or naturally occurring threats or incidents." (PPD-21)
- In the context of community resilience, the emphasis is not solely on mitigating risk, but implementing measures to ensure that the community recovers to normal, or near normal function, in a reasonable timeframe.

# What is a Community?

- The term “community” refers to a place that:
  - Is designated by geographical boundaries
  - Functions under the jurisdiction of a governance structure, such as a town, city, or county.
- Each community has its own identity based on its location, history, leadership, and available resources.
- Some systems (e.g., electric power) often extend beyond the boundaries of the community.

# Community Needs Drive Functional Requirements for the Built Environment




- Social systems drive the performance requirements for our built environment
  - Resilience levels for facilities and infrastructure systems depend on their role in the community
  - Enables a rational prioritization of available resources

# Community Resilience for the Built Environment

- Natural hazards
- Human-caused hazards
- Degradation
- Climate change

- Performance Goals
- Mitigation
- Response
- Recovery

Goal: Limit disruption to a duration desired by the community for an expected (design level) event, and minimize detrimental effects.

# Community Resilience Planning Guide Development Process

# Community Resilience Planning Guide

- The guide is targeted to local government as a logical convener
- Expands on previous resilience work in the public and private sector
- Provides specific guidance on how to plan for resilience
- The guide complements the National Preparedness System
- The guide has benefitted from extensive public and private sector input

# Next Steps

- Disaster Resilience Standards Panel
  - Planning to develop charter and bylaws has been conducted in parallel with the Guide development
  - Will issue a call for interested parties to register to participate on the Panel
  - First meeting planned for August 2015
- Support Implementation of the Guide
  - Work with communities interested in using the Guide to develop resilience plans
  - Gather feedback to support revisions to Guide
- Community Resilience Implementation Guideline
  - Provide guidance based on existing codes, standards, and best practices
  - Support implementation of resilience measures by communities

# Community Resilience Fellows

| Expert | Expertise |
|---|---|
| **Donald Ballantyne** | Water Infrastructure |
| **Joseph Englot** | Transportation Infrastructure |
| **Erich Gunther** | Electrical Power Infrastructure |
| **Stuart McCafferty** | Electrical Power Infrastructure |
| **Kevin Morley** | Water Infrastructure |
| **Chris Poland** | Community Resilience |
| **Liesel Ritchie** | Sociology of Disasters |
| **Jay Wilson** | Emergency Planning and Response |
| **Ted Zoli** | Transportation Infrastructure |
| **George Huff** | Business Continuity |

# Community Resilience R&D

- Develop tools to assess resilience at the community scale.
- Develop a conceptual model to explain long-term disaster recovery decisions by the public.
- Develop an economic analysis tools to facilitate cost-effective resource allocations that minimize the economic burden of disasters on communities.

# Community Resilience Center of Excellence

- Awarded to 10 institution team led by Colorado State University.
- $4M/year program funded through a cooperative agreement.
- Objectives are to:
  - Develop an integrated, multi-scale, computational modeling environment to accelerate development of systems-level models to enable new standards and tools for enhancing Community Resilience
  - Foster the development of data architectures and data management tools to enable disaster resilience planning for emergency and decision-making officials, code and standards professionals, engineering design experts, and researchers.
  - Conduct studies to validate resilience data architectures, data management tools, and models for a variety of hazard events including:
    - Tornado, hurricane, earthquake, flood, Wildland-Urban Interface (WUI)
    - Effects of climate change, and effects of aging infrastructure

# Concluding Remarks

- Improving resilience does not have to be prohibitively expensive
- Measures to improve resilience can be implemented over many years
- The new guide is intended to help communities develop customized long-term resilience goals and plans for their buildings and infrastructure systems .
- The Guide promotes integrated, systems-level planning and helps communities to prioritize investments and actions to improve resilience, as well as better define risks, priorities, and costs.

# NIST Contact

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# Questions?